

# Goals and outcomes of collaborative research

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The Agenda on TVO (2019)



**UNIVERSITY OF WATERLOO**  
FACULTY OF ENVIRONMENT

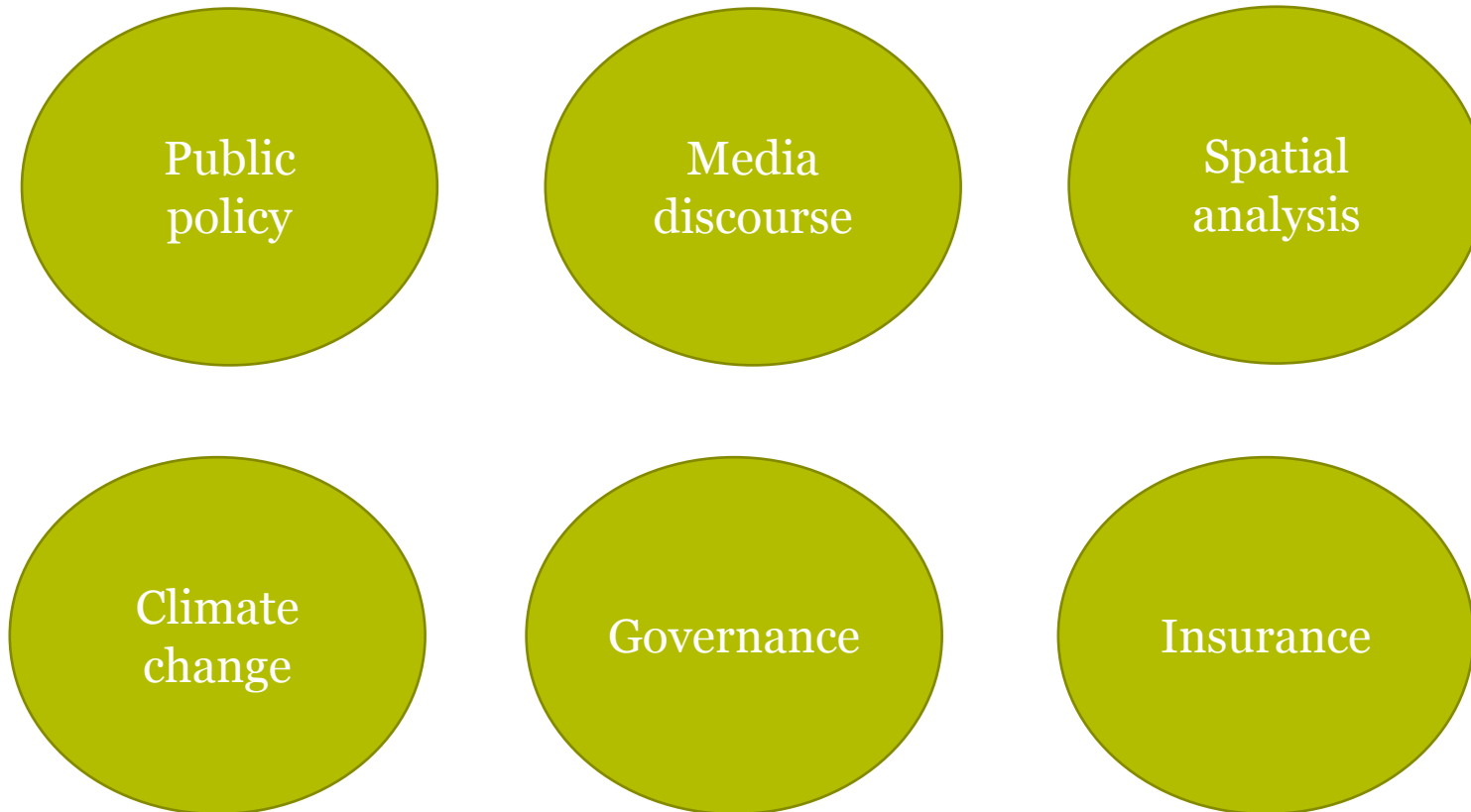


**FPRG**  
Flood Policy Research Group  
University of Waterloo

# About us



- Multidisciplinary research group focused on flood risk, 6 researchers



# How collaboration plays a role in research

- Phases of research process

(1) Conceptualization of research



(2) Research design and execution



(3) Publication and research dissemination



- Public and private stakeholder engagement across research process



# 1. Conceptualization of research

- What are current research needs and stakeholder interests?
- Finding research gaps by listening
  - Ongoing conversations with public and private stakeholders
  - Monitoring news articles about flooding, official statements from government, recent publications



# Example

- Policy discourse: public awareness and engagement in flood risk reduction

## Minister Goodale to host Flood Risk Roundtable

From: [Public Safety Canada](#)

### Media Advisory

Large scale disasters, such as floods, are increasing in frequency and severity across Canada. Creating a sustainable approach to flood risk management is a shared responsibility across the whole-of-society.

On November 16, 2017, the Honourable Ralph Goodale, Canada's Minister of Public Safety and Emergency Preparedness, will host a National Roundtable on Flood Risk in Regina, Saskatchewan. This roundtable will be attended by all levels of government, Indigenous leaders, private sector, non-government organizations and academia. The goal is to launch a formalized national dialogue on flood risk, and discuss what steps can be taken to address this challenge.

At the Roundtable, participants will focus on identifying measures to ensure that Canadian home owners understand their risk of exposure to flooding, and what they need to do to reduce that risk. Roundtable participants will also discuss the requirements for developing a sustainable financial management system for flood risk.

"I'm pleased that we will have participants at the Flood Risk Roundtable from across the country – and across the entire spectrum of the flood risk community. That includes representatives from Indigenous groups, the insurance industry, academic institutions, think tanks, and all levels of government. All of us have a stake in strengthening our communities' resiliency to flooding. The Roundtable is an opportunity to take a whole-of-society approach to making our communities and our country safer and more resilient."

- The Honourable Ralph Goodale, Minister of Public Safety and Emergency Preparedness

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Natural Hazards  
and Earth System  
Sciences 

### Communicating disaster risk? An evaluation of the availability and quality of flood maps

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**Abstract.** One of the key priorities for disaster risk reduction is to ensure decision makers, stakeholders, and the public understand their exposure to disaster risk, so that they can take protective action. Flood maps are a potentially valuable tool for facilitating this understanding of flood risk, but previous research has found that they vary considerably in availability and quality. Using an evaluation framework comprising nine criteria grounded in existing scholarship, this study assessed the quality of flood maps available to the public in Canadian communities located in designated flood risk areas. It found that flood maps in most municipalities (62 %) are low quality (meeting less than 50 % of the criteria) and the highest score was 78 % (seven of nine criteria met). The findings suggest that a more concerted effort to produce high-quality, publicly accessible flood maps is required to support Canada's international commitment to disaster risk reduction. Further questions surround possible weighting of quality assessment criteria, whether and how individuals seek out flood maps, and how flood risk information could be better communicated us-

certed effort to "reduce the damage caused by natural hazards ... through an ethic of prevention" (UNISDR, 2018).

This strategy of disaster risk reduction is embodied in the Sendai Framework for Disaster Risk Reduction, an international agreement endorsed in 2015 by 187 United Nations members. The framework's first priority – understanding disaster risk – exhorts member states to "develop, periodically update and disseminate, as appropriate, location-based disaster risk information, including risk maps, to decision makers, the general public and communities at risk of exposure to disaster" (United Nations, 2015, p.15). This priority supports risk-based decision-making through the transparent exchange of accessible and up-to-date risk information (United Nations, 2015, p. 14).

In the context of floods, this priority suggests that stakeholders must understand the probability of flooding at their location, the likely inundation zone of a flood of a particular magnitude, possible impacts on their property and assets, and measures they can take to mitigate the risk. Flood maps

# 2. Research design and execution

- Designing research methods
  - Gained access to proprietary flood risk data and models used by the insurance industry
    - JBA Risk Management, Guy Carpenter LLC
- Data leads to new research projects
  - Exploratory analysis to estimate future flood losses due to climate change
  - Map and quantify flood risk using insurance datasets

**RESEARCH** Open Access

**Application of re/insurance models to estimate increases in flood risk due to climate change**

Jason Thistlethwaite<sup>1</sup>, Andrea Mirano<sup>1</sup>, Jordan A. Blake<sup>1</sup>, Daniel Hemsch<sup>2</sup> and Daniel Scott<sup>3</sup>


**Abstract**  
**Background:** Floods are the most common and most expensive natural hazard, and they are expected to become more frequent as the climate changes. This article presents research that used re/insurance catastrophe models to estimate the influence of climate change on flood-related losses. The geographic focus of the study was the Canadian Maritimes—specifically Halifax, Nova Scotia—and it sought to determine how municipal risks due to rainfall-driven riverine floods could change as a result of climate change.  
**Results:** Findings show that annual flood losses could increase by up to 300% under a business-as-usual climate scenario by the end of the century (i.e., no mitigation or adaptation), even without accounting for changes to the built environment that could increase exposure (e.g., no population or economic growth).  
**Conclusions:** Increasing flood risk demands an open discussion about how much risk is acceptable to the community and what controls on further growth of exposure are necessary. Moreover, projected increases in flood losses put into question long-term insurability in the Halifax area, and highlight a broader problem facing metropolitan areas in Canada as well.

**Keywords:** Flood, Catastrophe losses, Risk management, Climate change, Public policy, Insurance

**Background**  
Catastrophe models are computer-assisted calculations that estimate financial losses resulting from natural hazard events. Created primarily for insurance purposes, catastrophe models quantify expected losses due to claims of policyholders affected by a particular hazard, such as a flood or earthquake. The information generated by catastrophe models is valuable to insurers for many reasons, including understanding their exposure to perils, informing risk-based premiums, and detecting areas that are uninsurable due to their high level of risk (Kotze and van den Bergh 2008; Lloyds 2014). Private sector catastrophe models are proprietary in nature, so access is restricted to insurers who are willing and able to invest in data and technology. As a result, they are often unavailable for public research studies and mass dissemination, and their use in the public domain is rare (Sampson et al. 2014).  
However, the information generated by catastrophe models is a potentially valuable input for public policy. First, by using catastrophe models to identify areas that are particularly prone to flood damage, insurers generate damage and loss information that could be used to improve maps of at-risk communities (Sarminski and Thissen 2017). Such maps could enable governments to prioritize investments in flood mitigation and encourage homeowners to purchase flood insurance. Second, catastrophe models generate loss estimates resulting from both frequent and rare floods, which could offer governments a basis to weigh the costs and benefits of flood mitigation investments (e.g., structural protections along rivers), regulate land use to reduce property exposure, and determine ways to share flood risk among governments, private stakeholders and homeowners.  
Similar to global trends, flooding is Canada's largest contributor to disaster losses, estimated to account for 78% of federal disaster assistance costs (United Nations

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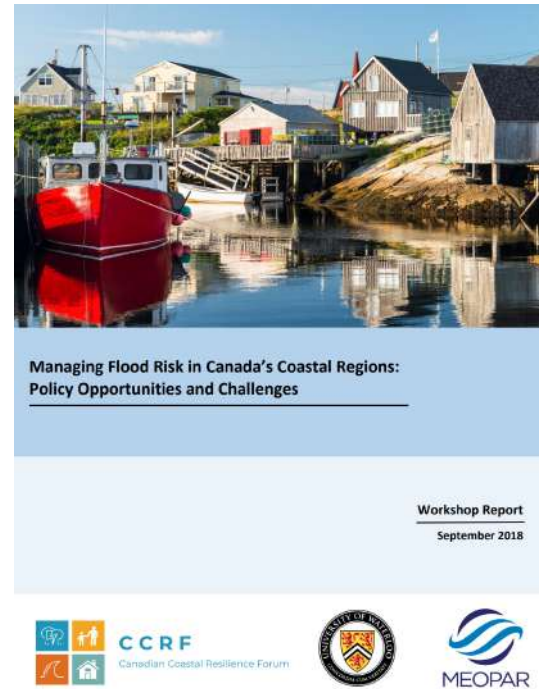
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 Springer Open



# 3. Research dissemination

- Publishing research in accessible (and concise!) formats
  - Open access journals
  - Policy briefs
  - Reports
  - Op-eds
  - Media releases
  - Community of practice
  - Etc.



Centre for International  
Governance Innovation

Policy Brief No. 131 – May 2018

## Buyer Beware: Evaluating Property Disclosure as a Tool to Support Flood Risk Management

Daniel Henstra and Jason Thistlethwaite

### Key Points

- Property disclosure offers a potential tool by which buyers could become informed about a home's history of flood damage and its exposure to future flood risk.
- Property disclosure to inform buyers about flood hazards has been entrenched in public policy in many other jurisdictions, but this approach has not been embraced in Canada.
- An effective flood risk property disclosure regime requires accurate, up-to-date and publicly available flood risk maps, clarification of legal liability associated with disclosures and a neutral third party to prepare and distribute property disclosure information.

### Introduction

Flood risk management is a strategic framework that involves modifying the probability and severity of flooding through preventive measures, while also reducing the vulnerability of people and property to flood-related impacts (Alexander, Priest and Mees 2016). In Canada, all levels of government have begun embracing risk assessment as the basis for setting protection priorities, combining multiple policy instruments to reduce flood risk such as public education, warning systems and so on) and sharing the responsibility for flood protection and recovery with businesses and individuals. These policy priorities reflect a key principle of flood risk management: since absolute protection from flooding is impossible, stakeholders (including individual property owners) must accept some responsibility by, for example, knowing their flood risk, subscribing to and heeding flood warnings, and adopting property-level flood protection measures (Sayers et al. 2015).

In order for individual property owners to play a meaningful role, they must be made aware of their property's flood risk and accept that they have a role in managing it. Improving public awareness of flood risk is an important step toward meeting Canada's commitment to the Sendai Framework on Disaster Risk Reduction. This 2015 international agreement identified "understanding disaster risk" as its first priority for signatories, arguing that "policies and practices for disaster risk management should be based on an understanding of disaster risk in all



# Influence of collaboration

- Collaboration can provide research direction
  - Trigger interest of those outside of academia
- Collaboration can lead to access to tools, data and expertise
- Collaboration can increase research impact
  - Media coverage, inform policy discourse



Daniel Henstra and Jason Thistlethwaite with Ralph Goodale, Minister of Public Safety (2017)





# Lessons learned

- Engagement with stakeholders is an ongoing process
- Collaboration takes time, but efforts can be reflected in research impact (e.g., grabs attention of government officials)
- Effective collaboration can be facilitated through research teams
  - Leverage existing relationships and networks, skillsets within team



THANK YOU



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